

Application No. 09/689,845
Attorney's Docket No. 015290-440
Page 3

REMARKS

During a telephone conference with Examiner Christianson on January 16, 2002, it was agreed that the application would be placed in condition for allowance if Claim 12 is amended to include the subject matter of Claim 13 and Claim 19 is amended to include the subject matter of Claim 20. As explained below, the amendment to Claim 12 is made for purposes of rejoining the method claims.

In the June 25, 2001 Official Action, restriction was required between method Claims 12-18 and apparatus Claims 1-11 and 19-31. Claims 1-11 and 19-31 were elected with traverse and Claims 12-18 were withdrawn from consideration. During the telephone conference with Examiner Christianson it was agreed that non-elected Claims 12-18 would be rejoined with the elected claims if Claim 12 is amended to include the feature of the top electrode being a showerhead electrode.

MPEP §803 states that claims to independent and distinct inventions will be examined if the search and examination can be made without serious burden. Claim 1 is directed to a showerhead electrode. Claim 19 is directed to a plasma chamber having a top electrode and the feature of the top electrode being a showerhead electrode is recited in Claim 20. Similarly, Claim 12 is directed to a method of treating a semiconductor in a plasma chamber having a top electrode and the feature of the top electrode being a showerhead electrode is recited in Claim 13.

In order to provide consistency between the subject matter of Claims 1, 12 and 19, Claim 12 has been amended to include the subject matter of Claim 13 and Claim 13 has been canceled. A similar amendment has been made to Claim 19, i.e., Claim 19 has been

Application No. 09/689,845
Attorney's Docket No. 015290-440
Page 4

amended to include the subject matter of Claim 20 and Claim 20 has been canceled. As such, the examination and search of all of the pending claims should not present an undue burden and all claims should now be in condition for allowance.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: Peter K. Skiff
Peter K. Skiff
Registration No. 31,917

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

Date: January 17, 2002

I hereby certify that this correspondence is being sent
by Facsimile Transmission to the Assistant
Commissioner For Patents, Washington, D.C. 20231
on:

Date: 1/17/02
Name: Laura Blair
(Typed or printed name of person signing the
certificate)
Sign: Laura Blair
(Signature of person signing the certificate)
Date: 1/17/02
(Date of Signature)

Application No. 09/689,845
Attorney's Docket No. 015290-440
Page 1

Attachment to AMENDMENT dated January 17, 2002

Marked-up Claims 12 and 19

12. (Amended) A method of treating a semiconductor substrate in a plasma chamber, said method comprising the steps of:

supporting the semiconductor substrate on a bottom electrode;

supplying process gas to the chamber;

forming a plasma adjacent an exposed surface of an upper electrode; and

processing the semiconductor substrate with the plasma;

wherein the upper electrode comprises a showerhead electrode having a plurality of gas outlets supplying the process gas into the chamber, the showerhead electrode having [has] a central portion and a peripheral portion surrounding the central portion, the peripheral portion including a step projecting from an exposed surface thereof and extending at least partially around the central portion, the step providing a predetermined localized density of the plasma formed adjacent the exposed surface of the showerhead electrode.

19. (Amended) A plasma chamber for use in manufacturing a semiconductor device, said plasma chamber including a top electrode and a bottom electrode having opposed surfaces facing each other and spaced apart from one another to define a gap therebetween, the bottom electrode comprising a substrate support, and the opposed surface of the top electrode being an exposed surface comprising a central portion and a step projecting from a peripheral portion thereof and extending at least partially around the

Application No. 09/689,845
Attorney's Docket No. 015290-440
Page 2

Attachment to AMENDMENT dated January 17, 2002

Marked-up Claims 12 and 19

central portion, the step controlling a localized density of the plasma formed adjacent the exposed surface of the top electrode and the top electrode comprising a showerhead electrode having a plurality of gas outlets through which process gas can be supplied into the plasma chamber.

I hereby certify that this correspondence is being sent
by Facsimile Transmission to the Assistant
Commissioner For Patents, Washington, D.C. 20231
on:

Date: 1/17/02
Name: Laura Blair
(Typed or printed name of person signing the
certificate)
Sign: Laura Blair
(Signature of person signing the certificate)
Date: 1/17/02
(Date of Signature)